

CLAIMS:

1. A medical device for placement within a body lumen of a patient, the device comprising:
 - a device housing sized for introduction into the body lumen;
 - a fixation mechanism to attach the device housing to a surface within the body lumen;and
 - a detachment mechanism to selectively detach the device housing from the surface of the body lumen.
2. The medical device of claim 1, wherein the fixation mechanism includes a cavity formed in the device housing and a shaft to capture luminal tissue within the cavity.
3. The medical device of claim 2, wherein the cavity includes a vacuum port for application of vacuum pressure to draw the tissue into the cavity.
4. The medical device of claim 2, wherein the fixation mechanism includes a spring to bias the shaft toward the tissue, and the detachment mechanism includes a solenoid coil wound about the shaft and a circuit to energize the solenoid coil to drive the shaft against the spring bias and thereby release the luminal tissue.
5. The medical device of claim 4, wherein the circuit is responsive to a control signal to energize the solenoid coil.
6. The medical device of claim 2, wherein the fixation mechanism includes a detent to abut a first end of the shaft and thereby maintain a position of a second end of the shaft relative to the tissue, and the detachment mechanism includes means for releasing the detent from the first end, and a spring to bias the shaft away from the tissue and thereby release the tissue.

7. The medical device of claim 6, wherein the releasing means includes a piezoelectric element and a circuit to energize the piezoelectric element to disengage the detent.
8. The medical device of claim 7, wherein the circuit is responsive to a control signal to energize the piezoelectric element.
9. The medical device of claim 2, wherein the detachment mechanism includes a fuse link in the shaft, and a circuit to apply current to blow the fuse link and thereby disengage a first portion of the shaft from a second portion of the shaft to release the luminal tissue.
10. The medical device of claim 9, wherein the circuit is responsive to a control signal to apply the current to blow the fuse link.
11. The medical device of claim 1, wherein the fixation mechanism includes a bonding agent, and the detachment mechanism includes a property of the bonding agent that permits rapid degradation of the bonding agent upon introduction of a degradation agent into the body lumen.
12. The medical device of claim 11, wherein the bonding agent includes a biologically mediated bonding agent.
13. The medical device of claim 11, wherein the bonding agent includes a clotting agent, and the degradation agent includes an anti-clotting agent.
14. The medical device of claim 11, wherein the bonding agent includes a fibrin glue, and the degradation agent includes streptokinase.
15. The medical device of claim 11, wherein the bonding agent includes a polymeric adhesive, and the degradation agent includes a depolymerization agent.

16. The medical device of claim 1, wherein the shaft includes a sharpened end to penetrate the tissue.
17. The medical device of claim 1, further comprising a power source to power the detachment mechanism.
18. The medical device of claim 1, wherein the power source includes a battery.
19. The medical device of claim 1, wherein the power source includes an inductive coupling circuit to generate power from an inductive element external to the body lumen.
20. The medical device of claim 1, further comprising a detector responsive to a control signal to activate the detachment mechanism.
21. The medical device of claim 20, wherein the detector includes a telemetry circuit to receive the control signal as a telemetry signal from an external controller.
22. The medical device of claim 20, wherein the detector includes a magnetic circuit to sense the presence of an external magnetic source as the control signal.
23. The medical device of claim 20, wherein the detector includes an inductive coupling circuit to generate power from an inductive element external to the body lumen and thereby drive the detachment mechanism with the generated power.
24. The medical device of claim 1, wherein the device housing is sized for introduction into the esophagus.
25. The medical device of claim 1, wherein the device housing is sized for passage through the gastrointestinal tract.

26. The medical device of claim 1, further comprising a sensor, mounted to the device housing, to sense at least one condition within the body lumen.

27. The medical device of claim 1, further comprising a sensor, mounted to the device housing, to sense at least one of pH, flow, temperature, and pressure within the body lumen.

28. The medical device of claim 1, further comprising:
an electrical pulse generator, mounted within the device housing, to generate an electrical stimulation waveform;
one or more electrodes electrically coupled to the electrical pulse generator and mounted to the device housing to deliver the electrical stimulation waveform to the body lumen.

29. A method for attaching and detaching a medical device within a body lumen of a patient, the method comprising:
positioning the medical device at a target location within the body lumen;
activating a fixation mechanism carried by the medical device to attach the medical device to a surface within the body lumen; and
activating a detachment mechanism carried by the medical device to detach the medical device from the surface of the body lumen.

30. The method of claim 29, wherein the fixation mechanism includes a cavity formed in the device housing and a shaft to capture luminal tissue within the cavity, and activating the fixation mechanism includes advancing the shaft to capture the tissue.

31. The method of claim 30, wherein the cavity includes a vacuum port for application of vacuum pressure to draw the tissue into the cavity, and activating a fixation mechanism includes applying vacuum pressure to the vacuum port.

32. The method of claim 30, wherein the fixation mechanism includes a spring to bias the shaft toward the tissue, and the detachment mechanism includes a solenoid coil wound about

the shaft, and activating the detachment mechanism includes energizing the solenoid coil to drive the shaft against the spring bias and thereby release the luminal tissue.

33. The method of claim 30, wherein the fixation mechanism includes a detent to abut a first end of the shaft and thereby maintain a position of a second end of the shaft relative to the tissue, the method further comprising releasing the detent from the first end of the shaft, and biasing the shaft away from the tissue to thereby release the tissue.

34. The medical device of claim 33, wherein the releasing means includes a piezoelectric element and a circuit to energize the piezoelectric element to disengage the detent.

35. The method of claim 29, wherein the detachment mechanism includes a fuse link in the shaft, and activating the detachment mechanism includes applying current to blow the fuse link and thereby disengage a first portion of the shaft from a second portion of the shaft to release the luminal tissue.

36. The method of claim 29, wherein the fixation mechanism includes a bonding agent, and the detachment mechanism includes a property of the bonding agent that permits rapid degradation of the bonding agent in the presence of a degradation agent, wherein activating the detachment mechanism includes introducing the degradation agent into the body lumen to rapidly degrade the bonding agent.

37. The method of claim 36, wherein the bonding agent includes a biologically mediated bonding agent.

38. The method of claim 36, wherein the bonding agent includes a clotting agent, and the degradation agent includes an anti-clotting agent.

39. The method of claim 36, wherein the bonding agent includes a fibrin glue, and the degradation agent includes streptokinase.

40. The method of claim 36, wherein the bonding agent includes a polymeric adhesive, and the degradation agent includes a depolymerization agent.
41. The method of claim 29, further comprising powering the detachment mechanism with a battery carried by the medical device.
42. The method of claim 29, further comprising powering the detachment mechanism with power generated by an inductive coupling circuit carried by the medical device in response to inductive energy generated by an inductive element external to the body lumen.
43. The method of claim 29, further comprising activating the detachment mechanism in response to receipt of a control signal from a controller external to the body lumen.
44. The method of claim 29, further comprising activating the detachment mechanism in response to presence of an external magnetic source.
45. The method of claim 29, further comprising positioning the medical device within the esophagus of the patient.
46. The method of claim 29, further comprising sensing at least one of pH, flow, temperature, and pressure within the body lumen with a sensor carried by the medical device.
47. The method of claim 29, further comprising:
generating an electrical stimulation waveform; and
delivering the electrical stimulation waveform to the tissue via one or more electrodes carried by the medical device.
48. A medical device for placement within a body lumen of a patient, the device comprising:
a device housing sized for introduction into the body lumen;
means for attaching the device housing to a surface within the body lumen; and

means for detaching the device housing from the surface of the body lumen in response to a control signal, wherein the attaching and detaching means are carried by the device housing.

49. The medical device of claim 48, wherein the attaching means includes a cavity formed in the device housing and means for capturing luminal tissue within the cavity.

50. The medical device of claim 48, wherein the attaching means includes a bonding agent, and the detaching means includes a property of the bonding agent that permits rapid degradation of the bonding agent in the presence of a degradation agent introduced into the body lumen.

51. The medical device of claim 50, wherein the bonding agent includes a biologically mediated bonding agent.

52. The medical device of claim 50, wherein the bonding agent includes a clotting agent, and the degradation agent includes an anti-clotting agent.

53. The medical device of claim 50, wherein the bonding agent includes a fibrin glue, and the degradation agent includes streptokinase.

54. The medical device of claim 50, wherein the bonding agent includes a polymeric adhesive, and the degradation agent includes a depolymerization agent.

55. The medical device of claim 48, further comprising means for sensing at least one of pH, flow, temperature, and pressure within the body lumen.

56. The medical device of claim 48, further comprising:
means for generating an electrical stimulation waveform; and
means for delivering the electrical stimulation waveform to the tissue.

57. A medical device for placement within a body lumen of a patient, the device comprising:
- a device housing sized for introduction into the body lumen;
 - a fixation mechanism to attach the device housing to a surface within the body lumen, wherein the fixation mechanism includes a cavity formed in the device housing, the cavity including a vacuum port for application of vacuum pressure to draw luminal tissue into the cavity, and a shaft to capture the luminal tissue within the cavity; and
 - a detachment mechanism to detach the device housing from the surface of the body lumen in response to a control signal, wherein the detachment mechanism includes an actuator to release the shaft from the tissue.
58. The medical device of claim 57, wherein the actuator includes a solenoid coil.
59. The medical device of claim 57, wherein the actuator includes a spring.
60. The medical device of claim 57, wherein the actuator includes a piezoelectric element.
61. The medical device of claim 57, wherein the shaft penetrates the tissue.
62. A medical device for placement within a body lumen of a patient, the device comprising:
- a device housing sized for introduction into the body lumen;
 - a fixation mechanism to attach the device housing to a surface within the body lumen, wherein the fixation mechanism includes bonding agent; and
 - a detachment mechanism to detach the device housing from the surface of the body lumen in response to a control signal, wherein the detachment mechanism includes a degradation agent to rapidly degrade the bonding agent.
63. The medical device of claim 62, wherein the bonding agent includes a biologically mediated bonding agent.

64. The medical device of claim 62, wherein the bonding agent includes a clotting agent, and the degradation agent includes an anti-clotting agent.

65. The medical device of claim 62, wherein the bonding agent includes a fibrin glue, and the degradation agent includes streptokinase.

66. The medical device of claim 62, wherein the bonding agent includes a polymeric adhesive, and the degradation agent includes a depolymerization agent.